INCOME PRODUCING VALUE OF WATER MUNICIPAL AND INDUSTRIAL IN VARIOUS AREAS OF NEW MEXICO

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Resources for the Future set up a research fund to be used to investigate the economic effect of water from the proposed Navajo Dam upon the San Juan and Rio Grande Basins. The assignment of the Municipal and Industrial Usage was made to Dean M. E. Farris of the University of New Mexico, with Professor Frank Bromilow of New Mexico A & M and myself as members of the committee, later on we called upon the services of Dr. Paul Zickefoose of New Mexico A & M.

The first question that the committee was faced with was "what is the value of a gallon or an acre foot of water to a given industry or to a municipality."

It was decided that a questionnaire addressed to water users in our category and in the area we were concerned with (San Juan County, Taos, Rio Arriba, Santa Fe, Los Alamos, Sandoval, Bernalillo, Valencia, Socorro, Sierra, Dona Ana, and Otero counties). Otero county was included because a request for diversion has been made. As our reference to locate these users we employed the 1955 DIRECTORY OF NEW MEXICO MANUFACTURERS published by the Bureau of Business Research of the University of New Mexico. After several abortive attempts a questionnaire was developed that would get the information needed and not poke into the individual's business too much, so that he would pitch it into the waste basket. A covering letter to explain the purpose and a descriptive sheet along with the questionnaire was sent to 498 industries and service organizations in the previously listed counties.

The questions on the questionnaire were:

1. Water delivered to our plant or plants for calendar year 1954.

   _____Total gallons in 1954

   If you have more than one plant, please list locations and give consumption of each.

2. If possible, please give the amount of water returned to sewer, river or ground.

   _____Total gallons in 1954 or_____%

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3. Source of water (check one or more), amount from each source, and cost by source in 1954.

Source	Amount	Cost
___Private or City owned Water Works	_____Gallons	$_____
___Pumped by you	_____Gallons	$_____
___Direct diversion from river	_____Gallons	$_____
___Other (please specify)	_____Gallons	$_____

4. Gross Sales for 1954 $_____
OR
Water cost per $1,000 gross sales for 1954 $_____

5. Average number of employees for year 1954_____

If you are a manufacturer, please answer the following question:

6. List your product(s) unit. Example, ton of coal, barrel of gasoline, loaves of bread, gross of pencils, etc.

7. Number of units produced in 1954_____

If you have any figures on your planned expansion of plant or product lines for 1957, 1960, 1965, 1970, 1975 would you please give us your thinking on these matters on a separate sheet.

If for any reason you do not have the necessary information for 1954 but do have it for another year, say 1953 or 1955, please state year and fill out the questionnaire.

The number of returns received from the questionnaire is probably rather good for this type of approach. One hundred and two returns having something written on the sheet were received, or 20% answering the request. Fifty-five of these returns stated that the information was not available, or that no water whatsoever was used, or that domestic water only was used.

Fifty-seven returns or 11% answered several of the questions asked.
Thirty-five or 7% returns gave the water delivered to the plant during 1954.
Twenty-nine or 5.8% gave an answer on the % of water returned to the sewer, river or ground.
Twenty-three or 4.6% gave information on water cost per $1,000 gross sales in 1954.

The spread in water cost per $1,000 gross sales was from 0.2 MIL per 1,000 dollars for a furniture and fixture manufacturer to $55 per $1,000 for a bath house. The number of employees ranged from 1 to 400, the reported gross sales (many did not answer this question) ranged from $5,000 to $4,700,000. So there were some rather large industries included in the returns.

After tabulating the returns and trying to make something out of them, it was decided that averages on water cost within industries did not mean much because of the great spreads or because of the small sample.

The next approach was to select what were felt to be natural industries for the areas considered, by virtue of raw materials available, the market at hand, and the consuming industries that are present in the area, or that seem logical as the industrial development of the state goes forward. Refer to Table II showing the basic economic factors that wer found from a variety of sources. Following Table II are the footnotes for the table.

My portion of this discussion will not get down to the items that really show the economic value of water as used in industry and by municipalities in the two basins. That part of the discussion will be handled by Professor Bromilow.

The pertinent information that Table II gives in this discussion is what amount of water in acre feet per year is required to supply one industry worker (including all employees, administration, clerical, and production workers) and the service employees that he requires. The footnote for line 2 of the table states that "it is assumed that each industry worker requires the services of one other worker in the community and that both of these workers are assumed to have two and one half dependents."

Line 1 then represents the estimate of the water that is required by the industry to support this one industry worker for one year. Line 2 shows the municipal water it is estimated will be required to support the industry worker his dependents, the service worker and his dependents, based on 150 gallons per day per person for seven people. The total of lines 1 and 2 is the value shown in line 3.

To get a rough estimate of the income producing value of water as utilized by the industry worker we might divide the value of sales in line 4 by the water in acre feet as shown in line 3, or the sum of lines--

7 Salaries & Wages
8 Property Income (in state)
9 State & Local Taxes on Industry
14 Material purchased (in state)
16 Fuel Cost
17 Elect. Energy Cost

divided by line 4 total water per industry employee per year. However, these two methods do not give a very good picture of the over-all gain to the state. The discussion of the real income producing value of the water will be given by Professor Bromilow in his discussion of how we used these basic economic factors in one of the diversion patterns.

Explanation of Items in Table II

Line 1 Industrial Water-Acre Feet - From Annual Survey of Manufactures: 1953 page 124

Line 2 Municipal Water-Acre Feet - Assumes that each industry employee requires one other worker in the community in the service category. Both of these workers are assumed to have two and one-half dependents. Thus 7 persons at 150 gallons water per day.

Line 3 Total Water-Acre Feet - Sum of Lines 1 and 2.

Line 4 Sales - An average of sales per industry employee for a group of companies in each field. Data obtained from the "Fortune Directory" (Supplement to Fortune July, 1957).

Line 5 Profit - Statistics of Income 1953 Part 2 Table 1 Line 35.

Line 6 Value Added - From Annual Survey of Manufactures: 1953 pages 24 to 40.

Line 7 Salaries & Wages - Same as Line 6.

Line 8 Property Income In State - *Apportionment In State and Out of State (Line 11) by Dr. Zickefoose in consultation with Mr. Ralph Edgel, Bureau of Business Research, U.N.M. "This information was computed from summaries of corporate balance sheets found in Statistics of Income. The industry breakdowns are not as distinct as one might hope, but those of the most nearly comparable industry group were used. By adding the total of interest paid, rents and royalties, corporate profits after taxes plus excess profits tax paid (which has since been discontinued) it was possible to compute a ratio of such payments to gross sales. This ratio, applied to sales per industry was used to make the estimates of property income. Distribution of this income was made on the basis that 90% of the capital would come from outside the state in all cases except Apparel and Related Products, Fabricated Metal Products, Stone, Clay, and Glass Products where a 50-50 distribution was used; and Chemicals and Allied Products where all the capital was assumed to come from outside the state."

Line 9 State and Local Taxes - Based on an assessment of 16% of Total Capital Investment (Line 20) and a tax rate of $6.25 per $1000 assessment. Or 1% of Total Capital Investment.

Line 10 Depreciation - From Statistics of Income 1953 Part 2 Table 1 line 26.

Line 11 Property Income Out of State - Same as Line 8.

Line 12 Federal Taxes Corporate - From Statistics of Income 1953 Part 2 Line 38.

Line 13 Miscellaneous Deductions - From Statistics of Income 1953 Part 2 Table 1 Lines 18, 21-23, 29, 30, 31. These deductions are: Benefits to Employees, Advertising, Interest Paid, Bad Debts, Repairs, Cost of Operation, and Other Deductions.

Lines 14 & 15 Materials Purchased In State and Out of State - Total amount determined by subtracting sum of Profit (Line 5), Value Added (line 6) and Cost of Fuel & Electricity (Lines 16, 17) from Sales (Line 4.) Apportionment In State and Out of State. * "The only available source was the 1947 Interindustry Relations Study of the Bureau of Labor Statistics. Total inputs as shown by this study do not always agree with value of materials purchased according to the census reports. The input data were adjusted to the census reports, so that in all cases the total bill of goods purchased was the same percentage of total sales as shown by the Census. Only the more important purchases were computed separately, the others were included in a miscellaneous category. A more or less arbitrary decision had to be made as to whether these inputs are now or whether they could come from the outside."

Line 16 Fuel Cost - From Annual Survey of Manufactures: 1953 page 122.

Line 17 Electric Energy Purchased - See Line 16.

Line 18 Employee State Tax - Based on Column 1 Food & Kindred Products - Income Tax 1% on net, $16.00 Property Tax at $6.25 per thousand $114.00, Sales Tax 2% of $2,000.00 or $40.00. All other columns calculated by ratio to salary in Column 1.

Line 19 Employee Federal Tax - Salary minus 10% earned income, minus $2,100.00 family deductions times 20% tax rate.

Line 20 Total Capital Investment per Industry Worker - An average for a group of companies in each field. Data obtained from "Fortune Directory" (Supplement to Fortune July, 1957).

Lines 21 & 22 In State and Out of State Investment - Same as Explanation Line 8 except read investment in place of income.

* From a report by Dr. Paul Zickefoose, Department of Economics, N.M.A.&M., which was commissioned by Industry Utilization Committee.

TABLE II

Economic Factors for the Group of Industries
Considered for San Juan and Rio Grande Basins

	1 Food & Kindred Products	2 Textile Mill Products	3 Apparel& Related Products	4 Chemicals & Allied Products	5 Stone, Clay & Glass Products	6 Fabri-cated Metal Products	7 Electric Machinery & Equipment
1.Industrial Water-Acre ft.	2.85	1.85	0.85	17.85	2.55	0.85	0.35
2.Municipal Water-Acre ft.	1.15	1.15	1.15	1.15	1.15	1.15	1.15
3.Total Water-Acre ft.	4.00	3.00	2.00	19.00	3.70	2.00	1.50
4.Sales	$27,000	$11,000	$5,650	$22,700	$12,130	$11,550	$14,800
5.Profit	868	445	124	3,030	1,515	925	1,440
6.Value Added	8,250	4,680	4,400	12,130	7,400	7,300	7,170
7.Salaries & Wages	3,600	3,000	2,750	4,430	3,850	4,260	4,030
8.Prop.Inc. in State	40	200	103	0	455	285	90
9.State & Local Taxes	40	70	40	170	90	65	56
10.Depreciation	200	165	33	625	315	175	195
11.Prop.Inc. out of State	365	20	103	1,910	455	285	820
12.Fed. Taxes Corp.	447	268	76	1,515	755	470	735
13.Misc. Deductions	2,550	895	1,295	3,480	1,460	1,260	1,244
14.Mat'l. Purchased in State	15,900	4,670	930	3,000	1,725	790	1,200
15.Mat'l. Pchsd. out of State	1,732	1,015	140	3,840	1,755	2,380	4,890
16.Fuel Cost	150	85	23	452	550	72	37
17.Elect. Energy Cost	100	105	32	249	185	83	61
18.Employee State Taxes	170	140	130	209	182	200	190
19.Employee Federal Tax	220	115	75	380	293	346	305
20.Total Capital Investment	4,000	6,800	4,000	17,000	9,000	6,500	5,600
21.In State Capital Investment	400	300	2,000	0	4,500	3,250	560
22.Out of State Cap'tl.Investment	3,600	6,500	2,000	17,000	4,500	3,250	5,040

For explanation of items by lines see Appendix _____ Page_____